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ABSTRACT

A descriptive study examined: the relative influence of native language (L1) literacy skills and second language (L2) oral proficiency on students' ability to read and spell in the second language. A second dimension of the study examined students' second language misspellings in order to identify examples of positive and negative transfer of L1 spelling knowledge. Pretests in reading, oral language, and spelling in L1 (Spanish) and L2 (English) were administered to 48 second- and third-grade students in a transitional bilingual education program. Samples of English spelling were collected for 20 weeks. The English spelling test was readministered as a posttest. Information on demographics and the nature of the instructional program was collected to facilitate comparison to other populations of second language learners. Results indicate that L1 literacy skill and L2 oral skill made equal and separate contributions to L2 literacy learning. Phonological knowledge of L1 spelling was found to transfer only positively. By contrast, subjects' conceptual understanding of L1 spelling was found to transfer in both positive and negative ways. (Author/MSE)

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DEVELOPMENTAL SPELLING AND THE TRANSFER OF LITERACY SKILL AMONG PRIMARY GRADE BILINGUALS

by

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THESIS

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This dissertation is dedicated to Virginia, Jo, and Jane Ferroli. I'll love you forever. I'll like you for always. As long as I'm living your baby, husband, and daddy I'll be.

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LJF

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SUMMARY

A descriptive study examined the relative influence of native language literacy skill and second language oral proficiency on students' ability to read and spell in the second language. A second dimension of the study examined students' second language misspellings in order to identify examples of positive and negative transfer of first language spelling knowledge.

Pre-tests in reading, oral language, and spelling in Spanish (first language) and English (second language) were administered to 48 second- and third-grade students in a Transitional Bilingual Education program. Samples of English spelling were collected for 20 weeks. The English spelling test was re-administered as a post-test. Information on demographics and on the nature of the instructional program was collected to facilitate comparison to other populations of second language learners.

First language literacy skill and second language oral skill were found to make equal and separate contributions to second language literacy acquisition. Phonological knowledge of first language spelling was found to transfer only positively. By contrast, the subjects' conceptual understanding of first language spelling was found to transfer in both positive and negative ways.

I. INTRODUCTION

A. Background

The English spelling system operates on three conceptual tiers (Henderson, 1985). It is an alphabetic system in that the graphemes represent sounds of spoken language. The word ran has three letters and each accounts individually for a phoneme in the spoken word. At the same time, the sound that a letter represents is determined by letters around it. The sound associated with the letter a in rain is different from the sound associated with a in ran because the letter that follows the a is different. The second conceptual tier, then, is that English is spelled by patterns of letters. English is also spelled according to meaning. It is the meaning tier that distinguishes the spellings of rain and rein. To illustrate the alphabetic, pattern, and meaning principles further, the letter s has an alphabetic and a common phonemic representation, /s/; s followed by h in the word ship, however, denotes a different sound, one based on pattern; yet, it is meaning that determines the sounds associated with the s and the h in the word mishap.

Read's (1971, 1975) now classic description of the articulatory basis of invented spellings--spellings children reason out by using letter names to represent how the sounds within words are pronounced--spawned a body of research which shows that children learn to spell in a developmental sequence (Beers, Beers, & Grant, 1977; Beers & Henderson, 1977, 1980; Gentry, 1978, 1982; Henderson, 1981; Morris & Perney, 1984; Read, 1971; Zutell, 1979) proceeding through the acquisition of a series of tacit orthographic generalities. That is, children's conceptualizations of how English is spelled undergo qualitative changes over time. The result of this line of

research is a view that children progress across the following developmental stages:

Preliterate Stage--where children use pictures, random letters, and letter-like shapes in spelling, but the symbols they use to write bear no relationship to the sounds in the words they are attempting to spell.

Semiphonetic and Phonetic Stages--where children understand that written language consists of symbols that represent the sounds of spoken words. Spellings at this stage reflect an understanding of the alphabetic principle. Using a letter-name or a letter-sound strategy, children gradually represent an increasing proportion of the sounds in the words they are attempting to spell.

Transitional Stage--where a visual memory of spelling patterns becomes apparent and children's spellings are influenced by orthographic conventions.

Correct Stage--where meaning influences spelling.

Research using speakers of languages other than English (Ferroli & Krajenta, in press; Gill, 1979; Hudelson, 1981-82; Stever, 1980; Temple, 1978) has identified a comparable unidirectional progression from less sophisticated to more sophisticated strategies although the spelling strategies are instantiated differently in different languages.

B. Statement of the problem

Students in a Transitional Bilingual Education (TBE) program which uses a Native Literacy Approach embark upon learning to spell the second language armed with the knowledge of how at least one other language is spelled. That additional knowledge is helpful to the learner in the form of positive transfer, which is "any facilitating effects on acquisition due to the

influence of cross-linguistic similarities" (Odlin, 1989, p.168). However, when the two languages use very similar alphabets but are conceptually different in their spelling systems then the cross-linguistic influences can result in errors, overproduction, or underproduction which is known as "negative transfer." That is, first-language (L1) spelling knowledge can facilitate learning to spell a second language (L2), but it can also create some confusion. The broad question driving this investigation was "How does being literate in Spanish influence the subsequent learning of English spelling for primary grade students?"

C. The research questions

This investigation sought to provide evidence concerning a question related to the program models used in educating LEP students. That is, "what are the critical variables in explaining how quickly and how well English spelling is learned by LEP children?"

The second question sought to contribute to the body of knowledge about developmental spelling. "What is experienced by the youngster in transition who knows how to spell in Spanish and who might be predisposed, therefore, to expect an alphabetic representation in spelling when it comes to learning to spell in English?" It was hypothesized that the Spanish literate youngster would show a developmental series of representations for English spelling. First might come a Spanish phonetic representation--that is, spelling English words as if they were Spanish words. The word whole, for example, might be spelled JOL. Next, a phonetic representation might be expected in which the student learns to use English letter-sound associations (whole = HOL). Then, an English pattern representation might appear (whole = HOWL, HOAL, or HOLE). Finally, an English meaning representation would be expected where whole is

spelled correctly and distinguished by context from hole. This transitional-developmental hypothesis provided a heuristic through which children's misspellings were analyzed and interpreted.

The third question that this investigation attempted to answer was meant to contribute to the efficient instruction of children who are in transition from a native language Spanish approach in literacy instruction to instruction in English reading and spelling. The question is, "which features of Spanish orthography readily transfer to spelling in English, which English features are learned after a short period of instruction, and which features remain troublesome for a longer period of time?"

D. Significance of the study

The debate over the effectiveness of various bilingual program models and their short- and long-term merits is not a new one. It has, perhaps, gone on for too long. Crawford (1989) charged that evaluative research in bilingual education has traditionally been politically motivated, poorly done, or both. He called for a new direction in bilingual research--one that can lead to instructional improvement within program types. This is the direction taken in this study. To those charged with the responsibility of selecting among program alternatives, the significance of this study lies in the information it provides about the relationship among variables within a program that takes a Native Literacy Approach for a short period followed by an early transition to English reading. The point is not which program is better, but how to improve this one type of program.

English spelling acquisition develops in stages. A learner's acquisition of initial spelling skill in Spanish should develop similarly due to the shared alphabetic nature and letter-sound correspondences. However,

how does changing languages impact upon that development for the learner in transition? Will progress in spelling across developmental stages continue, or will there be a regression? If there is a regression, is it short-lived or lasting?

The results of this study should not be limited to our understanding of spelling development. The transitional-developmental hypothesis will be tested in spelling, but generalizing the results can certainly have significance for those interested in reading development. When the native language is highly regular in letter-sound correspondences, as is the case in Spanish, a native language literacy approach positively contributes to the early acquisition of word attack skill (Gilooley, 1973). If this skill transfers, the time spent in L1 instruction will have achieved a major objective of beginning reading instruction, and it would have done so in a comprehensible way. Further, children would have been permitted access to fundamental experiences and opportunities for growth in comprehension and vocabulary.

Again, how does a change in languages impact on continued reading development? Knowing a word's spelling provides a way of coding the sounds of a word and, thereby, facilitates storing the word's pronunciation and meaning in memory (Ehri, 1980). Thus, it seems possible that the process of forming Spanish-like orthographic images for spoken English words can provide the reader with some useful cues in word identification as well as a framework for analyzing those parts of words which deviate from Spanish-like expectations. If progress in spelling continues, it seems likely that it should do likewise in reading. If children in transition regress in spelling, for a short time or for longer, a similar pattern in reading development can be inferred.

Finally, Thonis (1976) argued that traditional reading programs used in educating LEP children make scarcely any provision for dealing with the interferences that children experience from the native language. To those charged with the instruction of LEP children, a thorough understanding of the transferability of specific spelling features from Spanish to English will be a significant contribution. It can enable them to make the provisions that Thonis found lacking not only so that interferences can be minimized but also so that children can maximally profit from their native language literacy skill.

Thus, the significance of this study is three-fold. It provides evidence useful for the concerns of bilingual program model builders, insights into how changing languages influences the developmental nature of learning to read and spell, and information of considerable instructional value for teachers of LEP children.

II. CONCEPTUAL FRAMEWORK AND RELATED LITERATURE

A. Conceptual framework

This study is concerned with how Spanish literate children transfer spelling skill to English. Spelling is conceptualized as a constructive, problem-solving thought process; as such, it is viewed as a dimension of literacy that offers a particularly revealing medium for observing children's basic knowledge. Making inferences about how that knowledge is transferred from one language to another can be accomplished by analyzing the children's spelling in relation to their oral language facility and in the context of their instructional program. The analysis must also be guided by an understanding of the two languages' letter-sound correspondences, pronunciations, and orthographic systems.

1. The native language approach to literacy instruction

When non-English speaking students enroll in schools in the United States a fundamental issue arises. Either written language instruction is postponed while children learn at least some spoken English, or children learn reading in their native language. For over 100 years, and continuing into the 1970s, it has been common practice in the U.S. for Spanish-speaking school children to be placed in English reading programs whether the children speak English or not (Thonis, 1976). Venezky (1970) characterized the results of this effort as "disastrous."

The other alternative employs the Native Literacy Approach. This has both theoretical and logical appeal as it permits children to begin reading instruction earlier, recognizes and honors the children's cultural heritage, and begins reading instruction in the most comfortable language (Venezky, 1970). It capitalizes upon children's preschool years--the sound

saturation experienced, the language models heard, and the opportunities for imitation (Thonis, 1976). It provides children with an understanding of what reading and writing are for and gives them a resource to use as they move into reading and writing English as well as confidence that they can read and write in English (Hudelson, 1987).

The last two or three decades have seen the evolution of a variety of program models which are designed to meet the needs of Limited English Proficient (LEP) students. Often called "bilingual" programs, they are of many types, and they vary in their organizations along several dimensions: goals, methods by which English is taught, length of program enrollment, and how much and in which subject areas the native language is employed in literacy instruction and in other school subjects.

Crawford (1989) describes ten of these programs in his "Glossary of Program Models." According to his description, two models are not designed for teaching second-language students to learn in the native language. "Enrichment immersion" is designed for language majority students learning a second language. A "two-way model" is for both populations (majority and minority) to learn both languages.

Three models provide no L1 instruction. "Submersion," also known as "sink or swim," is self-explanatory and illegal since the U.S. Supreme Court determined in its Lau v. Nichols (1974) decision that no treatment whatsoever for LEP students is a violation of their civil rights. "Immersion" programs isolate L2 students and provide instruction exclusively in English that is appropriate to the students' level of competence. A French immersion model has been successful in Canada with English-speakers. These students maintain their native English, as it is the dominant language, while adding a second

language. Use of this approach with language minority students, however, is discouraged by researchers as the result tends to be subtractive bilingualism where minority children lose their native language ability (Crawford, 1989).

Crawford (1989) described three models which use L1 for the purpose of making instruction intelligible. "Concurrent translation" freely shifts between languages to communicate each idea. Although the approach is still prevalent, studies have shown that students ignore the second language portion of the instruction. "Alternate immersion," or "sheltered English," provides the same or similar instructional content in one language and then the other, but separates it in some way such as on alternate days or mornings and afternoons. The very common "English as a Second Language" (ESL) programs utilize the native language as needed to help students in their classes while providing the opportunity for continued development of English acquisition.

The remaining two models are the ones most likely to employ a Native Literacy Approach. "Transitional Bilingual Education" provides native language instruction in school subjects while students learn English. The goal in TBE programs is to prepare students to enter all-English classrooms, usually within two or three years. Crawford (1989) reports, in drastic contrast to popular perception, that English has been found to be the medium of instruction from 72 to 92 percent of the time in TBE programs. Nevertheless, these programs may still stress native language development and many provide initial literacy instruction in L1. With an early-exit goal, however, English reading instruction is provided simultaneously or it replaces native literacy instruction after a rather short period of emphasis.

"Maintenance," or "developmental," programs use native language literacy instruction in an attempt to preserve or enhance students' L1 skill. There is

far less emphasis placed on exiting students from these programs, and native language instruction in some school subjects may continue through the sixth grade.

The distinction between TBE programs and developmental programs focuses upon one of the cornerstone theoretical constructs in the field today. In Crawford's words:

> In two years of bilingual instruction or less, most children acquire basic interpersonal communications skills (BICS), also known as "playground English." But several studies have shown that cognitive-academic language proficiency (CALP), the linguistic foundation that children need for academic pursuits, takes five to seven years to achieve in a second language. According to the threshold hypothesis of Jim Cummins, a LEP child must reach a minimum level of CALP in the native language before literacy skills will "transfer" to English. (pp. 175-176)

To be accurate, Cummins (1979) does not actually argue that literacy skills will not transfer prior to achieving a minimum level of CALP. Rather, he claims that CALP is necessary for getting the maximum benefit from first language literacy and that, lacking CALP, literacy and academic development in L2 will be slower than it otherwise would be.

Does an early-exit TBE model provide sufficient time to realize a substantial benefit from literacy skill developed in L1? Does a late-exit developmental model truly achieve an effective advantage for later learning as a result of the time allotted to and invested in L1 literacy development? Crawford (1989) concludes that the research evidence provides a convincing mandate for the extended use of L1 in bilingual programs, including in the

area of reading instruction. Earlier reviews and research had not taken such a clear position of advocacy and found, instead, that the Native Literacy Approach had not shown unequivocally beneficial results (Ching, 1976), that results had been mixed (Hatch, 1974; Pena & Verner, 1981), or that the question remains unanswered (Gunther, 1980; Thonis, 1976). Recently, the U.S. General Accounting Office (1987) reported that a consensus of experts concluded that the most recent research evidence does support the law's requirement of the use of the native language toward learning English as well as toward making academic progress in other areas.

American schools are simultaneously pedagogical and political institutions. As such, a school administration determines its approach to the instruction of LEP students not merely in relation to its philosophy, objectives, and resources, but guided, also, by federal, state, and local politics. The federal government certainly has wavered on the issue from the mid-1970s' era of strong enforcement of the use of L1 to its late 1980s' era of promoting alternative approaches that make no use of the native language in instruction.

Two other factors that enter quite heavily into a school district's adoption of a program model are the size and the linguistic diversity of its LEP population. Approaches which rely on native language instruction become untenable when there are small numbers of LEP students, or a great many native languages, or both.

For the present purpose of examining cross-linguistic literacy transfer, suffice it to say that some LEP children are instructed for a period of time in programs that employ a Native Literacy Approach. Regardless of the program model employed, a critical issue in the education of LEP students and

specifically in regard to literacy instruction is that of the transfer of literacy skills from L1 to L2. Or, more succinctly, what transfers and when?

2. The transfer of literacy skill

"Transfer is the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired" (Odlin, 1989, p.27). One of the basic assumptions that must be held in a TBE program that uses a Native Literacy Approach is that one learns to read only once. Different sound-symbol associations need to be learned for reading in a second language, but once they are, the essential concepts of reading can be transferred (Gunther, 1980).

Concerning Spanish-English bilinguals it can be assumed that left to right directionality and an understanding of the alphabetic principles do transfer (Thonis, 76). Paulston (1974) maintains that there is transfer of symbol-sound decoding reading skills from one language to another provided they use the same alphabets. Rodriguez-Brown (1988) showed correlational data that suggest that spelling skill transfers from English to Spanish. Certainly, extracting meaning from print is a reading skill that is not language specific and so it readily transfers from one language to another (Deemer, 1978; Gunther, 1980).

Deemer (1978) disagreed with the assertion that positive transfer occurs only when one uses both languages with ease. She gave reading comprehension tasks in both English and Spanish to college students who were enrolled in intensive English classes to help them reach a proficiency level where they would be able to handle a normal academic course-load. The subjects had been previously assigned to beginning, intermediate, and advanced levels of such

classes. She found that the correlation between first and second language reading skill does become stronger as the students gain proficiency in the second language, but that the positive correlation between L1 and L2 reading becomes established well before the student can be termed fluent in the second language. Her conclusion was that literacy skill transfers even among students who are not very far along in acquiring L2 proficiency.

What transfers and when? The contention taken in this investigation is that everything one knows about literacy transfers, that it transfers to another language as soon as it is known in any language, and that most, but not all, of that knowledge transfers positively.

3. Oral language and second language literacy acquisition

Rodriguez-Brown (1979) argues that decisions about when LEP children are ready for all-English classrooms focus too narrowly on oral English proficiency and that they do so to the exclusion of the relationship between L1 reading ability and English reading acquisition. Nevertheless, oral language and reading skill are related language arts and a positive relationship does exist. This is, oral English proficiency is a good predictor of how readily LEP children will learn literacy in English.

Lopez-Emslie (1985) reported that scores on an oral language dominance measure were good indicators of future English reading success, and Gunther (1980) found that higher scores on L2 oral tests were associated with higher scores on L2 reading tests. Yet, the relationship is not so simple as good L2 oral makes for good L2 reading, nor that good L1 reading makes for good L2 reading. As stated earlier, Deemer (1978) reported that, among LEP students who were classified as high in oral English ability, there was a strong correlation (r = .84) between reading in English and reading in Spanish.

Among students in the middle category in oral English there was a positive, although nonsignificant, correlation between L1 reading and L2 reading. However, among the low English ability students there was only a slight relationship between L1 reading and L2 reading. Thus, there seems to be a relationship between oral English ability and subsequent English reading acquisition; yet, which variable (English oral or L1 reading) might make the greatest contribution to English reading acquisition seems still to be in question. Further, it seems reasonable to expect that the interrelationship among these variables changes across time and degrees of proficiency.

4. Spelling as a medium for observing transfer of learning

When children read and spell accurately we can only tell that they are correct. It is children's errors that allow us to make inferences about how they approach the task. If each attempt to spell is viewed as a constructive, though often unconscious, problem-solving thought process (Gabrielson, 1987), the nonstandard spellings may be viewed as providing data from which children's basic knowledge may be inferred.

Read (1986) maintains that beginners' spellings give evidence of what phonetic properties are relatively salient for children. As they progress, "spelling truly develops, rather like children's drawings, from representing salient and concrete properties with a few simple strategies to representing more abstract properties with a variety of strategies" (p. 41). He concludes that spelling is a psycholinguistic performance and misspellings are to be understood in terms of both linguistic and cognitive concepts.

Temple (1978) reasoned that, irrespective of the language in which they write, consistent errors imply that children are using orthographic generalities. Taking this view in conjunction with the belief that readers

and spellers apply what they figured out about the process in one language to reading and spelling in another (Hudelson, 1987), then spelling becomes a promising medium for observing that transfer of literacy skill. Thus, a careful analysis of the misspellings produced by children who are literate in Spanish and just beginning to learn to read and write in English can provide a framework for understanding how these children are reconceptualizing their L1 literacy knowledge and applying it to L2.

5. Phonemic-orthographic contrasts of Spanish and English

"The Spanish speakers who know how to read their own language will tend, when they reach the English class, to transfer the phonetic value of the Spanish symbolization to English" (Crandall, Dias, Gingras, and Harris, 1981, p. 37). Hudelson (1983) provided observational data of a first grade girl in precisely this setting. She characterized her approach to the task as follows: "Janice had developed two strategies for spelling English, 1) memorize the English spelling if you can; 2) if you haven't memorized the word, spell the word how you are able to pronounce it and use Spanish orthography" (p. 6).

As Spanish literate children learn to spell in English they are likely to experience positive and negative transfer. Spanish and English are both alphabetic languages which use Roman characters. The children's understanding of the alphabetic principle, thus, must certainly serve them well. Further, the children have learned a set of letter-sound associations in Spanish, and many of these correspond directly to English orthography. At the same time, the children should encounter some contrasts in letter-sound correspondences between Spanish and English. These could lead to misspellings.

Another likely source of error is pronunciation. Much of the negative transfer evident in misspellings can be attributed to native language pronunciation rather than to native language orthography (Odlin, 1989). Hatch (1974) showed that interference from pronunciation differences does occur. He had subjects categorize English words which were written on cards. Using the example fit which, with a Spanish pronunciation, comes out as the English word feet and was frequently placed into a category of body parts, he concluded that phonological interference does occur from L1 to L2 even in silent reading.

Read (1986) reviewed studies on dialect and spelling and concluded that pronunciation does effect spelling, especially for younger children. He surmised that this occurs primarily because youngsters inner-recreate speech sounds while spelling. That is, no matter how a word is pronounced by a teacher or examiner, the youngster sets about spelling the inner-recreated pronunciation. Thus, both letter-sound correspondences and pronunciation should play roles as the Spanish literate student engages in the spelling of English words.

a. Consonants

Phonemic transcription will be used in the following section and throughout this manuscript as it provides sufficient precision for the purposes of this study. In phonemic transcription only phonemes are given symbols, as opposed to phonetic transcription which accounts for different degrees of allophonic detail (Crystal, 1980). Phonemic transcriptions will be set off by oblique brackets, (/ /), which indicate that the sound of some utterance is being described and that a special alphabet and not the ordinary one is being used (Graddol, Cheshire, & Swann, 1987). The symbols which will

be used are listed in Figure 1. Also, all references made to letters or words will be underscored. When children's spellings or possible spellings are described they will be capitalized. (e.g., "The ph in the word phone has the sound /f/, and the children might spell it with F.")

1) Similarities

English and Spanish share some consonant letter-sound correspondences. The sound represented by b, f, l, m, n, and s are similar in the two languages. K can be added to this category of shared consonants although, in Spanish, it is found only in words of foreign origin. English y has a similar sound in Spanish when it is used as a consonant. The letter x is generally alike in the two languages, although it is pronounced like /s/ in some Spanish words and like /h/ in some place names of Mexico. These English letter-sound correspondences should present little difficulty to children who know how to spell in Spanish. Immediate positive transfer is expected.

Vowels

SHORT

æ	bat
ɛ	bet
I	bit
ɑ	pot
ʌ	but

LONG

e	bait
i	beat
aI	bite
o	boat
u	boot

R-INFLUENCED

r	barn
or	born
ɚ	burn

DIPHTHONGS

ɔ	bought
ʊ	put
aʊ	bout
I	boy
ju	cute

UNSTRESSED

ə	about

SEMI-VOWELS

j	yet
w	wet

Consonants

SINGLE

b	bib
d	did
f	fife
g	gag
h	heat
ǰ	jeep
k	kick
l	lull
m	mime
n	nine
ŋ	sing
p	pop
r	red
s	sis
t	tot
v	vine
z	zip

DIGRAPHS

č	cheap
š	ship
ž	measure
θ	thin
ð	then

The letter-sound correspondences for t and p are similar in Spanish and English. English pronunciation differs because the sounds of these letters are aspirated. In spite of this slight difference, the child approaching the spelling of English words through Spanish orthography should be generally successful in using these letters.

The letter-sound correspondences for c are basically the same in both languages. That is, there are two common sounds and they occur in the same environments--/k/ before a, o, and u and /s/ before e, and i. Although there are more exceptions to this pattern in English, use of the letter c should, for the most part, transfer positively from Spanish to English.

2) Limited differences

The letter d represents another pronunciation difference. In Spanish, depending on its position in the word, d can very often take the sound of /ð/. This is not so in English. Therefore, the Spanish literate child might use the letter d to account for other sounds (see below), but in applying one's Spanish spelling knowledge to account for English /d/ the child should arrive at D.

Another example of a letter that has dissimilar pronunciations in the two languages but which should not cause spelling difficulty is that of the letter r. In some positions the Spanish r is strongly trilled. In other positions, the Spanish r is pronounced with a single tap of the tongue. Neither is so in English. The Spanish literate child applying Spanish orthography to account for an untrilled English /r/ should arrive at R anyway, for while the pronunciations are somewhat different, English /r/ is more like Spanish /r/ than like any other letter-sound.

Other consonant spellings should be more problematic. As with c, the letter g has two common sounds in both languages. However, only one of these sounds are shared, /g/. G does not take the sound /ǰ/ in Spanish as it does in English. One alternative sound for g in Spanish is a strongly aspirated /h/. Thus, the Spanish literate child should have no difficulty accounting for /g/ with G but would have no reason to use G for /ǰ/ and might use G for /h/.

Another problematic consonant is Q which represents the same sound in both languages, and, in both, it is followed by u. The difference is that in Spanish the u is silent (Spanish qu is /k/), while in English it often takes the sound of /w/ when it follows q (English qu is /kw/). In transferring spelling knowledge from Spanish to English the youngster might use QU to account for the /k/ and then use another vowel to account for the /w/ or the spelling might not include a Q at all.

3) Strong differences

The remaining categories of single consonants should be very problematic for Spanish literate youngsters attempting to spell in English. The letter z never represents the same phoneme in Spanish that it represents in English. In Spanish s and z are not phonemically distinct, and /z/ does not occur except as an allophone. Ching (1976) maintains that when the Spanish speakers encounter English sounds that do not exist in Spanish they will replace them with sounds that closely resemble the English ones or with sounds that frequently occur in the same position in Spanish. The Spanish literate speller should have little success in using the letter z for these reasons. It seems quite likely that S would be used instead because of

articulatory similarities as /s/ and /z/ are both alveolar fricatives (/s/ unvoiced and /z/ voiced).

While the children in this study would have encountered printed Spanish words that use b and v, these letters carry only allophonic differences in spoken Spanish. As the children would not have needed to discriminate between /b/ and /v/ in their native language, difficulty in choosing between B and V in English spelling can be expected.

The phoneme /w/ exists in Spanish. It is arrived at by the letter u before another vowel as in agua or huevo. The letter w, however, is found in only a very few foreign words. Thus, if one is applying Spanish spelling knowledge to English words, using w correctly seems even less likely than using y or z.

There are two letters that exist as graphemes in both languages and have fairly consistent letter-sound correspondences in both languages, but the match between grapheme and phoneme is reversed. These are h and j. Spanish j sounds /h/ and, thus, is most like English h. Spanish h is silent. The Spanish literate speller could be expected to use J where English calls for h and to have no basis for using English J in spelling /ǰ/. Difficulty in representing /ǰ/ should also arise with English words that begin with dr. The d in these words is affricated and sounds /ǰr/. There is no exact equivalent in Spanish. A similar sound in some dialects of Spanish is that accounted for by y as in inyectar. In sum, spelling the sound /ǰ/ should present difficulty for the Spanish literate child, and Y seems the most likely substitution.

Several varieties of consonant combinations might be troublesome for the Spanish literate youngster. Spanish has words that include consonant clusters that begin with s, but these never occur at the beginning of words. There is

a tendency on the part of some Spanish speakers toward prosthetic e--that is, adding a vowel sound to the beginning of such English words (Ching, 1976). So, too, in spelling, the pronunciation difference might be accounted for by adding an additional vowel letter to words that begin with s plus another consonant.

No Spanish words end in two consecutive consonant sounds. There is a tendency on the part of some Spanish speakers to drop the final consonant sound in pronunciation of these English words (Ching, 1976). As with the example of clusters above, pronunciation might well influence spelling, and the final consonant might be omitted from words such as just and hoped which, in effect, end with two consecutive consonant sounds.

Other problematic English consonant spellings are digraphs. Spanish has one consonant digraph ch. Its sound corresponds quite directly to the English sound for ch, and spelling it should pose no difficulty. Spanish, however, has no direct equivalent for sh. In some dialects /š/ exists as an allophone of ch. The sounds /š/ and /č/ are quite similar in articulation as the former is a voiceless fricative and the latter a voiceless affricate. For these reasons it is quite likely that CH will be a common substitute for English words that call for SH.

The digraph th does not exist as a grapheme in Spanish, nor does the phoneme /θ/. /ð/ does occur in Spanish as an allophone of the letter d. It can be expected, then, that the voiced sound for th, /ð/, will be represented by Spanish literate children with D. The unvoiced th, however, has no equivalent.

The English phoneme /ž/ as in measure has no equivalent in Spanish. It should be especially problematic in spelling as none of the three phonemes most similar in articulation, /ǰ/, /š/, and /z/, exist in Spanish.

If the sounds in two words differ only in voicedness (e.g. the English words pin and bin), the voicedness is said to have phonemic relevance. Ching (1976) asserts that, in Spanish, voicedness has no phonemic relevance. While this is not, in fact, the case as evidenced by the words peso/beso, pelo/velo, pollo/bollo, it suggests that distinguishing words based on voicedness occurs considerably less often in Spanish. Duncan (1983) argues that if the difference between two phonemes is critical, learning to discriminate will occur more rapidly than in the absence of the need for such a minimal distinction. Because the need to distinguish minimal pairs based on voicedness occurs less often in Spanish it can be expected that there will be a category of English spelling errors that result from this difference. Consonant pairs that are articulated similarly but distinguished only by voicedness (p, and b, t and d, k and q, f and v, s and z, ch and j) should be initially confusing to primary grade Spanish literates as they will have had less previous need to learn to discriminate between them.

b. Vowels and vowel patterns

There can be no question that the linguist would find considerable fault with the lack of specificity in the preceding analysis of consonant phonemes. Likewise, the succeeding analysis of vowels might be viewed as unsophisticated. While we know that young children can sometimes make precise articulatory distinctions, it should be kept in mind that this investigation focuses on the phonemic judgements made by primary grade students whose ages range from seven to nine years. Further, instructional

utility guides this analysis more so than does phonetic precision. Therefore, the vowel sounds that follow are categorized not according to the linguist's articulatory gestures of American English but according to a traditional scope and sequence of vowel instruction in primary grade reading programs in American schools. This entails: short vowel sounds, long vowels, and vowels influenced by r.

Ferroli and Krajenta (in press) have shown that Spanish speaking kindergarten and first grade students who learn initial literacy in their native language realize an extraordinary degree of accuracy (in contrast to English speakers) in their spellings of vowel sounds. Thus, as they enter into spelling English words they are equipped with a stable knowledge of one set of vowel sounds. However, Spanish vowels have one pronunciation apiece and these match one of the English pronunciations but never correspond to the most frequent English pronunciation (Nash, 1973). Further, there are four (Ching, 1976) to six (Crandall, Dias, Gingras, & Harris, 1981) vowels that exist in English but not in Spanish. Still further, English and Spanish share the five basic vowel graphemes, yet only one of these, o, has a shared letter-name. Given this state of affairs, the Spanish literate attempting to spell English words should experience positive transfer for only a few vowel spellings, negative transfer for those that are in contrast, and the need for some problem solving in accounting for English vowel sounds for which there are no Spanish equivalents.

1) Short vowels

Among the five English short vowels four have no Spanish equivalents. These are short a, /æ/, e, /ɛ/, i,/I/, and u /ʌ/. The short e and i are similar to some Spanish pronunciations of e and i, although

the English vowels are more open in pronunciation. Read (1971, 1975) has shown that children do categorize vowels according to similarities in place of articulation. Thus, some degree of accuracy was expected in spelling short e and short i, while a and u should be more problematic. Short o, /ɑ/, presents a different problem. It corresponds quite directly to a Spanish vowel. That vowel is a, and spelling /ɑ/ with A rather than O seems quite likely.

2) Long vowels

Among the five English long vowels all of them have Spanish equivalents. This should not, however, facilitate accurate spelling as only one, the o, shares the same grapheme. The next most direct match is long u.

Long a, /e/, and long e, /i/, have equivalents in Spanish, but, as in the case of short o, they correspond to different graphemes. English long a corresponds to the Spanish e, and English long e corresponds to Spanish i. The English long i, /aI/, also exists in Spanish, but it, too, is a case of mismatched graphemes. In Spanish, /aI/ is spelled AI as in baile, AY as in hay, or ALL as in caballo. These last three present children with considerable spelling difficulty as they face a situation in which letter-sound correspondences for which they have already developed a stable understanding should lead them to incorrect English spellings.

As confusing as all of this is likely to be for the Spanish literate youngster, the long vowels present an even more problematic issue--that of vowel marking. English long vowels generally require the a second silent vowel be present which marks the long vowel (except for those in very short words, such as so, and in some polysyllabic words). To illustrate, the long vowels in beat and boat are marked with a subsequent silent a. The long vowel

in bait is marked with the silent i. The long vowels in bite and cute are marked by the final silent e. Long vowel markers are an example of the pattern principle, or the second tier, of English spelling. A previous conceptualization of spelling that worked well in Spanish was to spell one letter for one sound or, in the case of diphthongs, two letters for what are, by definition, two sounds. At this point, however, accurate spelling of pattern-based English words requires that the Spanish literate youngster takes a quantum leap. These require not merely learning to spell new sounds, nor merely learning a different set of letter-sound correspondences; rather, one needs an entirely different conceptualization of how spelling works.

3) R-influenced vowels

In English words a vowel sound can be influenced by the presence of a following r. There are a variety of such patterns, but traditional instruction holds that ar sounds / r/, or sounds /or/, and er, ir, and ur sound /ɚ/. Ar and or correspond quite directly to Spanish letter-sounds. The vowel of /ɚ/ is one that does not exist in Spanish. The young Spanish literate should have success at spelling English / r/ and /or/. Spelling /ɚ/ with Spanish orthography could lead to either AR or OR because /ɚ/ includes a mid-central vowel that does not exist in Spanish whereas / r/ includes a low-central vowel and /or/ includes a mid-back vowel. Even though Spanish uses the graphemes er, ir, and ur, none of these represent /ɚ/, so spelling /ɚ/ should pose difficulty.

This section on the phonemic-orthographic contrasts has speculated on the likely misspellings that can be attributed to differences in letter-sound correspondences and pronunciations between English and Spanish. A caution put

forth by Odlin (1989) should be included at this point--not all spelling problems can be attributed to native language influence. That is, the children will most certainly experience some of the same spelling problems that native English-speaking learners experience.

6. The conceptual-orthographic contrast of English and Spanish

English orthography is a complex and regular relationship in which phoneme and morpheme share leading roles (Venezky, 1970), whereas Spanish is very much driven by phonemes. This conceptual difference is another reason that English spelling problems might arise for Spanish literate children.

To illustrate, the sounds represented by the letter a in the English words nation and national are different; yet there is no change in spelling. The English spelling system tolerates this sort of phonetic inconsistency for the sake of staying true to the morpheme. By contrast, the c in the Spanish verb sacar (to take out) has the sound of /k/. If a teacher tells the class, "Take out your books," the verb must end in -en, but the c in sacen (sac + en) would have the sound of /s/ due to the e which follows. The correct Spanish verb, instead, is saquen where there is a spelling change so that the medial consonant maintains the /k/. Thus, where English tolerates phonetic inconsistency for the sake of the morpheme, Spanish sacrifices the morphemic base for the sake of phonetic regularity.

Gilooley (1973) uses the term "phonographic" for spelling systems such as Spanish where meaning is represented via sound. He uses the term "orthographic" for spelling systems like English where meaning is more directly represented with letters and letter sequences. He reviewed research that reported that phonographic representational systems facilitate word attack development among beginners and that orthographic representational

systems result in greater reading speed at intermediate stages because, by permitting reading in larger chunks, orthographic systems don't require so much decoding. Yet, at advanced levels of reading there is no difference in rate among readers of the various representational systems. He hypothesizes that readers of simpler writing systems catch up, in terms of rate, by eventually forming orthographic representations.

Rodriguez-Brown and Budinsky (1987) worked with native English-speaking 7th through 12th graders who were enrolled in a Spanish class. They gave them various spelling tasks and then asked the students to write what strategies they used. Good spellers reported using visual and analogy strategies in both English and Spanish while the poorer spellers reported relying on sound. It is interesting to note that good spellers reported using visual and analogy strategies even in Spanish where, for the most part, it is not necessary. It seems entirely plausible that these good spellers used a visual approach as a result of first learning to spell in English and that they were transferring their conceptually-based understanding of how spelling works.

Henderson (1985) cautioned that problems with learning the complexities of spelling can arise if children are taught to attend only to sound in spelling without attending to pattern and meaning. Although Henderson's context was specifically that of English spelling, learning first in any phonographic system may lead to just that. That is, "the relative simplicity of Spanish orthography may lead the inexperienced writer to suppose that one may rely on the ear for identifying the correct written forms" (Staczek & Aid, 1981, p. 150).

Gibson and Levin (1975) posited that children learning to read in English develop a set for diversity--that pupils become accustomed to seeing

one written form represent several different speech elements and to associating several written forms for a single speech element. Temple (1979) reversed their construct and proposed that Spanish literates develop a "set for uniformity"--that one expects phonetic regularity in spelling--and, as a result, when learning to read English, they might "be slow in developing sensitivity to morphemic, semantic, and etymological factors in spelling (and reading)" (p. 155).

Contrasts between the conceptual representations in the two spelling systems can be exemplified by the past-tense marker. In Spanish, the past tense markers -ado (used with verbs that end with ar in the infinitive) and ido (used with verbs that end with er or ir in the infinitive) are spelled as they sound. In English, however, the -ed marker can represent three different sounds: /t/ as in dropped, /d/ as in leaned, and /ed/ as in pointed. Thus, English requires that the Spanish literate child, who has been able to approach spelling on the basis of sound, becomes aware of the difference between phonemes and morphemes and learns to spell morphemes as meaning units and not according to how they sound.

If a conceptualization for spelling can be transferred from one language to another as the research of Rodriguez-Brown and Budinsky (1987) suggests and if first learning to spell in Spanish leads the youngster to rely on the ear as Staczek and Aid (1981) and Temple (1979) suggest, then Spanish literates might be slow in coming to terms with the multi-tiered nature of English spelling, especially if they make this transition while still in the primary grades where, according to Gilooley's (1973) hypothesis, they have not yet had the opportunity to form orthographic representations. Students in transition might show a great deal of movement in English spelling from initial Spanish-

like phonetic representations to later English phonetic representations. However, because of their conceptualization of how the system works, they might perseverate there and show little movement into pattern-based or meaning-based representations.

B. Review of related literature

Oller and Ziahosseiny (1970) studied English spelling errors of LEP students to determine the proportion of positive and negative transfer that was experienced by speakers of various languages. Their subjects were 356 college students who took an ESL Placement Exam Dictation Test. The subjects were classified according to whether their native language used a Roman alphabet (Spanish mostly, also German and Slavic) or a non-Roman alphabet (Chinese, Japanese, Semitic). To rule out differences in overall English skill they tallied the non-spelling errors the students made and used this as a covariate in an ANCOVA procedure. They found that the non-Roman alphabet users made more errors overall but that Roman alphabet users made more spelling errors. They concluded that knowledge of one Roman writing system makes it more difficult, not less, to acquire another Roman spelling system. That is, among these subjects, the letter-sound associations which they had previously established resulted in negative transfer which outweighed correct generalizations.

The hypothesis of Oller and Ziahosseiny (1970) was that wherever minimally distinct differences occur between L1 and L2 these will be the most difficult to learn. These results suggest that English spelling features that do not exist in Spanish will be easier to learn than spelling features which are mismatched between the two languages, such as accounting for /i/ with I in Spanish but E in English.

Terrebone's (1973) subjects were twenty native Spanish speakers from two college freshman English classes for foreign students at a southern U.S. university. She analyzed 458 spelling errors which arose in dictation exercises and in their themes. In spite of the fact that most of her subjects had studied English in their native countries for from two to five years, she found that the "influence of the various native Spanish phonetic, phonemic, and orthographic systems upon the students' writing resulted in spelling practices which were quite distinct from those of native English speakers" (p. 136). There is a tendency to perceive English sounds as if they were Spanish phonemes and allophones and to represent English sounds in a Spanish orthography.

These Spanish speakers had a great deal more trouble with consonant substitutions than with vowels. Almost half of these errors involved consonant doubling. She also found a large number of errors of addition of prosthetic E (e.g. ESTRICT for strict). Confusion arose in using S and Z and in using D for /ð/.

Among vowel errors, O was used for /ʌ/ and A was sometimes used for /ɑ/. As might be expected, E was used for /e/, I for /i/, and AI and AY were used for /aI/. O was used for /aʊ/ and OU for /ɔ/. The unstressed vowels led to errors as well. Most frequently they were misspelled with E, but A, O, U, and I all occurred several times each. The largest group of vowel deletions that she identified involved the omission of the silent e long vowel marker. It seems, then, that even for college-age students who have several years of study of English, the pattern principle in English spelling remains an elusive one.

Nathenson-Mejia (1989) studied six- and seven-year olds in the American School of Pueblo, Mexico, who were at the mid-point of their first year of formal English instruction. The children were considerably more proficient at letter-naming and word reading in Spanish than they were in English. The instructional treatment consisted of sessions that included reading to the children from an English trade book, discussion of the story in English and Spanish, choral rereading, drawing pictures, and writing stories or captions for the pictures where she encouraged the children to invent spellings. Several types of consistent misspellings were identified that were related to phonological differences between English and Spanish. The children spelled s-clusters by beginning them with ES; they used J to spell /h/ and G for /w/--all reflecting their own pronunciation and knowledge of Spanish orthography.

Among consonant digraphs, D was used to spell /t/ and /ð/ and LL was used to spell /š/. SH and CH were frequently substituted for one another. She reasoned that the children used CH for /š/ because /č/ is similar in sound and CH is more familiar to the children. However, she interpreted their use of SH for /č/ as indicating an awareness of the English /š/ and an attempt to reconcile an unfamiliar sound within their own sound and spelling systems.

Vowel misspellings also showed that the children were using the Spanish sound equivalents. E was used for /e/. I was used for /i/. Two consecutive vowels were used to spell the English long i.

Cronnell (1972) analyzed the English spelling errors produced by third and sixth grade Spanish speaking students in an end-of-the-year writing assessment from one inner-city school in Los Angeles. Among consonant errors, Cronnell found "simplification of the final consonant clusters was the most

frequent error that could be attributed to pronunciation; e.g., HAN (hand), THING (think)" (p.10) probably because Spanish does not have final consonant clusters. Consonant digraphs were also problematic. The spellings of /č/ and /š/ were frequently interchanged. Also, /ð/ was often spelled with D because the grapheme th does not exist in Spanish, but /ð/ is a common allophone of /d/.

The three most common vowel errors were using I for /i/, A for /a/, and E for /e/. In fact, these accounted for 4.2% of all spelling errors. These are all examples of using Spanish vowel letters for English vowel sounds. Another common vowel misspelling involved the sound /ɚ/. Cronnell's subjects frequently used AR to spell both /ɚ/ and /ar/.

Alvarez (1973) used a 15-word spelling test in each language to examine the cross-linguistic spelling influences among second grade Spanish-speaking students. Half of the subjects were enrolled in a bilingual program and half were receiving instruction exclusively in English. He found that in spelling English there were more mistakes committed on consonants than on vowels. "However, the kinds of errors were three times as many in spelling vowels than in consonants" (p. 161). That is, the Spanish literate youngster makes more consonant errors than vowel errors, but the English vowels are so elusive that there is scarcely any pattern. One could expect, then, that as Spanish-speaking children begin to receive English reading and spelling instruction consonants would realize correction earlier while vowel spellings would remain problematic. Specific features which were found to be troublesome for these subjects were that "initial /ð/ of they is heard as /d/, and so it is spelled. The final voiceless /θ/ is heard as /s/ and is so reflected in its spelling" (p. 133).

These studies, taken together, indicate clearly that Spanish literates encounter spelling difficulties in English that are attributable to letter-sound contrasts, pronunciation differences, and a lack of understanding of the multi-tiered English spelling system. They provide rich data from which an assortment of spelling errors can be predicted. What seems still to be missing, however, are data that explain not what errors to expect but which types of errors are corrected early on and which types remain problematic for a longer duration. Once this is known a developmentally focused instructional sequence can be formulated which maximizes initial positive transfer from Spanish literacy while addressing the cause of the troublesome spelling features.

This literature review and analysis of spelling and pronunciation differences between Spanish and English shows that oral language and first language literacy skill seem to be related to one's acquisition of second language literacy. It also shows that this relationship is supportive in many ways while differences in the two languages might cause some negative transfer. Finally, it has been stated that much of the research in bilingual education has focused narrowly on the overall effectiveness of various problem models. An important task that remains is to gather evidence on cross-linguistic literacy transfer and to frame it in such a way that the results provide a foundation of knowledge upon which instructional alternatives can be built. It is hoped that such a knowledge base can assist those who offer services to LEP students to capitalize upon the benefits of cross-linguistic transfer.

III. METHODOLOGY

A. Subjects

The subjects were drawn from the second and third grade classes of a Spanish-English TBE program in a suburban Midwestern public elementary school. Students were excluded from the study if their reading instruction in the previous school year was in English or if they transferred in after pre-testing was completed. One subject was excluded whose parents did not consent to participation in the project. This resulted in 48 subjects (26 boys, 22 girls), 41 of whom constituted the entire second grade population and 7 third graders who were assigned to the two lowest ability-level reading groups in their grade. All subjects had just begun to receive reading instruction in English as the project began and continued to receive reading instruction exclusively in English throughout. One subject moved during the project. Thus, the number of subjects is 48 for some analyses and 47 for others.

1. The nature of the instructional program

The students enrolled in this bilingual program comprised a little over half of the school's primary grade population. For the most part, they exit the bilingual program after three years of enrollment (excluding kindergarten). Some especially high achieving students transfer to all-English classrooms at the end of first grade or at the end of second grade. Most of the children enter all-English classrooms at the beginning of grade four. The children in all grades of the bilingual program attend special area classes (music, art, PE) with their counterparts from the all-English classrooms. These classes are conducted exclusively in English.

In the kindergarten and first grade classrooms Spanish is the primary language of instruction for all school subjects including reading. Basal

reading materials in Spanish are provided, but their use represents much less than half of the reading instruction. The teachers prefer an integrated Spanish language arts program in which they employ the language experience approach, trade books, and a heavy emphasis on writing. Spelling instruction, complete with weekly word lists and Friday tests, begins in the second semester of first grade. The lists used are based upon word frequency rather than upon the phonetic elements in the words.

There are daily periods of instruction in oral English. The children are exposed to English print during these periods as the teachers use selected books, verses, signs, etc. in their lessons. The objective, however, is the development of oral skill in English, and any English reading that is learned is viewed as a by-product of the oral language development program.

The children who are the subjects of this study, then, have had exposure to English print not only from their environments outside of school but within the classroom as well. Their formal reading and spelling instruction, however, had been in Spanish prior to grade two, and their English literacy instruction is just beginning. This is true, also, of the seven third graders who, because of late arrival or low achievement, had received their reading instruction in Spanish during the previous school year. Throughout the K-3 program reading instruction is an either/or proposition. At no point is formal reading instruction provided simultaneously in the two languages.

In grade two English reading instruction begins, and formal reading instruction in Spanish is discontinued. The basal reading materials are used much more than in the first grade but much less than they are used in the all-English second grade classes. The teachers rely upon trade books, writing, and assorted supplementary materials. The spelling program uses teacher

constructed word lists which emphasize phonetic regularity and spelling patterns. Care is taken to use words that are within the children's meaning vocabularies. In the second grade overall the language of instruction is approximately evenly split between the two languages, although in some subjects English is used slightly more than Spanish. When the children write in their daily journals they are invited to use whichever language they choose. Classroom libraries are supplied with books in both languages.

English reading instruction continues in third grade where the basal reader received greater emphasis. English is the language of instruction approximately 80 to 90 percent of the time although this proportion varies from year to year depending on the students' proficiency. The language for writing and free reading is a matter of choice in one of the third grade classrooms, and, in the other, exclusive use of English is encouraged.

2. The community

All of the children in this study reside in one subdivision within the community. The subdivision is populated almost entirely by Spanish-speaking residents. 57 percent of the subjects were born in the United States and 43 percent were born in Mexico. 98 percent of their parents were born in Mexico with most emigrating from the state of Durango. Spanish is the primary language spoken in and around the children's homes.

The teachers report that the subjects' parents were typically employed as agricultural laborers when they were in Mexico. In most of the families at the time of this study both parents were employed outside of the home. There is a good deal of industry in the larger community and three-fourths of the parents worked as laborers in the local factories.

B. Measures

1. Oral language

Three subtests which comprise the oral language cluster of the Woodcock Language Proficiency Battery--English (1980) were used. These subtests are: Picture Vocabulary, Antonyms-Synonyms, and Analogies. Three parallel subtests comprising the oral language cluster of the Batería Woodcock Psico-Educative En Español (1982) were used. The Examiner's Manuals for these two tests endorse comparing performances on these two batteries for determining a subject's relative proficiency in the two languages.

2. Reading

Three subtests which comprise the reading cluster of the Woodcock Language Proficiency Battery--English (1980) were used. These subtests are: Word Identification, Word Analysis, and Passage Comprehension. The three parallel subtests comprising the reading cluster of the Batería Woodcock Psico-Educative En Español (1982) were used.

3. Spelling

Spelling proficiency in English and Spanish was determined through the use of developmental spelling tests (DSTs). These are informal, rather than standardized, instruments which are administered using a traditional spelling test format. English DSTs are used to identify a student's spelling stage, or conceptual understanding of English orthography. The scoring system for the English DST is taken largely from that developed by Morris and Perney (1984) and has been expanded based upon the research of Ferroli and Shanahan (1986). The complete scoring system appears in Appendix A. The items and test directions are reported in Table I.

Spanish orthography, on the other hand, is highly regular in its relationship between spelling and sound; thus, a Spanish DST can be described simply as a phonetic spelling test rather than one that identifies a student's conceptual understanding. Nevertheless, a procedure for using a Spanish DST has been created and validated (Ferroli & Krajenta, in press) which uses a zero- to five-point scoring scale in a manner similar to an English DST. The Spanish DST and directions for administration are presented in Table II. The scoring system is found in Appendix B.

C. Procedure

Subjects were pre-tested in Spanish and English on three variables: oral language, reading, and spelling. Pre-testing was conducted during October and November of the school year. The English DST was readministered as a post-test during the last week of April.

1. Tests

The Woodcock tests were selected because they are rich in technical data, offer parallel forms in English and Spanish, and are completely scripted. These tests were individually administered by the investigator. It must be noted that although the investigator has sufficient Spanish speaking ability to permit administering these scripted tests he can by no means be considered a fluent bilingual. Assistance was provided by the bilingual teachers at the project school in two important ways. First, they

TABLE I

DEVELOPMENTAL SPELLING TEST--ENGLISH FORM

Directions: Say each word. Use it in a sentence. Repeat the word. It is permissible to change or expand upon the sentences to clarify to the children which word they are attempting to spell.

	Words	Sentences	Words
1	TACK	A tack is a small nail.	TACK
2	SKIN	Skin covers our hands.	SKIN
3	MAIL	I got a letter in the mail.	MAIL
4	DRESS	We dress for school in the morning.	DRESS
5	LAKE	It's fun to watch the boats out on the lake.	LAKE
6	CLEAN	Make sure your hands are clean.	CLEAN
7	LIGHT	Turn on the light, please.	LIGHT
8	DRAGON	The scary dragon breathes fire.	DRAGON
9	STICK	We use glue to make things stick together.	STICK
10	WIDE	The truck's wheels are very wide.	WIDE
11	BLEED	A cut will make you bleed.	BLEED
12	PRESS	Don't press too hard on your pencil.	PRESS
13	BASKET	The Easter Bunny carries eggs in a basket.	BASKET
14	HIRE	A boss needs to hire many workers.	HIRE
15	QUIT	Our old car quit working.	QUIT
16	YELL	The fans yell at a football game.	YELL
17	FREEDOM	We opened the cage and gave the bird its freedom.	FREEDOM
18	VASE	The glass vase on the table has a flower in it.	VASE

TABLE II

EXAMEN DEL DESARROLLO DEL DELETREO EN ESPAÑOL

Direcciones: Este es un examen de deletreo. Algunas de las palabras son difíciles. Si no saben deletrearlas perfectamente, no se preocupen. Solo escriban las palabras lo mejor que puedan.

	Palabras	Oraciones
1	VERANO	En el verano no hay clases.
2	GENTE	Hay mucha gente en la ciudad.
3	BAILE	Fuimos al baile el sabado.
4	SUEÑO	Yo sueño en la noche.
5	ACERA	Ella habla acerca de ti.
6	ARROZ	Me gusta el arroz con leche.
7	CÁLLATE	"Cállate, me hijo," dijo Mamá.
8	SAQUEN	La maestra dijo que saquen los libros.
9	LEYENDO	Estoy leyendo un libro de cuentos.
10	BRINCANDO	Estoy brincando la cuerda.
11	MAESTRAS	Las maestras nos enseñan a leer.
12	ESTRELLA	La estrella brilla en la noche.
13	FUERTE	Mi papá es fuerte.
14	GUAPO	En la television vi a un hombre guapo.
15	ZAPATO	Se me perdio el zapato.
16	ESTUDIANTE	Un estudiante hace siempre su mejor trabajo.
17	PAYASO	A mí me gusta el payaso que está en el circo.
18	HABLEMOS	La maestra dice que hablemos en voz baja.

trained the investigator to fluently pronounce all the directions needed for administering the tests. Further, all test sessions were audiotaped. The teachers listened to the tapes to confirm or correct the investigator's scoring when any problematic responses arose.

The Woodcock tests were administered in consecutive sessions to each student. The Spanish reading and oral language tests were administered during the first session and the parallel English tests during the second session. It was decided not to counterbalance the test administrations by language (English before Spanish for half of the subjects and Spanish before English for the others) as no group comparisons were to be made. Further, as the directions for the tests are similar, it was judged advantageous to administer the first test in the children's primary language. Thus, when the subjects took the English tests they had some familiarity with the types of tasks they were being asked to do.

The DSTs were group administered in classrooms by the regular classroom teachers. These, as well as traditional spelling tests, were regularly used by the teachers at the project school and were seen by the students as being within the normal course of classroom events.

2. Spelling samples

Weekly spelling samples were collected over a period of twenty weeks in order to determine how the children changed in their renderings of various spelling features. Five new words which incorporated spelling features of interest were added to the children's weekly spelling tests. These were in addition to the regular list words which the children had the opportunity to study and practice. The additional words were referred to as "extra" words or "bonus" words. The children were put at ease about being

tested on words that they had not studied. They were told and reminded frequently that the extra words did not affect their report card grades, but they were strongly encouraged to do the very best that they could. The weekly samples were administered in a traditional spelling test format: say the word--use it in a sentence--repeat the word. The words and weeks in which they were used are presented in Table III.

TABLE III

WORDS USED IN WEEKLY SAMPLES

Week	Words				
1	heart	short	stuff	third	wait
2	comb	dropped	jaw	mitten	true
3	flag	pointed	save	smile	took
4	cute	hurt	leaned	towns	twenty
5	bug	freeze	her	planted	zipper
6	bird	fork	joke	marches	stopped
7	measure	nurse	played	tooth	white
8	draw	jumps	nice	oil	seated
9	cubes	knocked	nose	ticket	wood
10	grabbed	messes	out	slide	true
11	counted	game	keep	nuts	yard
12	dirt	hoped	serves	sport	this
13	August	burned	Roy	treasure	watches
14	cartoon	cents	quack	united	voice
15	just	roof	shaped	which	years
16	boxes	church	earth	glued	pass
17	born	hard	loaded	shirts	size
18	clowns	dropped	stuff	wood	yell
19	cute	jaw	leaned	pleasure	wishes
20	bakes	half	pointed	quiz	those

IV. RESULTS

A. Proficiency and growth of the subjects

Before statistical analyses are used to answer the research questions it is necessary to present results which characterize these subjects. Summary statistics for all variables are reported in Table IV.

The oral language and reading scores in Table IV are standard scores. From these a variety of derived scores are possible but all are problematic in that the English tests were normed with monolingual English-speaking students in the United States and the Spanish tests were normed with monolingual speakers from several Spanish-speaking countries. Yet, to facilitate generalizations to other subject populations it is necessary to characterize the abilities of these subjects in comparison to normative data. It is also necessary to make comparisons within this subject sample about their relative abilities in reading, oral language, and spelling in Spanish and English. For these purposes Table V shows the reading and oral language standard scores of these subjects in comparison to the scores reported for subjects in similar grades in the two original norming studies for these tests (Woodcock, 1985a; 1985b).

It can be seen from these data that the oral English proficiency of the subjects in this study was about the same as or lower than the level of the English-speaking kindergartners from the norming study. In terms of reading ability in English, the subjects of this study scored slightly better than the first-graders in the norm group. In comparison to the Spanish-speaking subjects in the norming study, the second graders in this study scored about the same as the first graders did in oral language. The third graders in the present study scored about midway between where the first and third graders

from the norming study scored in oral language. The Spanish reading scores in the present study were well above those of the first graders and somewhat lower than those of the third graders in the norming study.

TABLE IV

SUMMARY STATISTICS[a]

Variables	Means	SDs	Ranges
Eng Spell1	36.25	12.06	15-74
Gr 2	34.63	10.88	15-59
Gr 3	45.71	15.09	29-74
Eng Spell2	54.04	15.39	19-88
Gr 2	53.85	15.71	19-88
Gr 3	55.33	14.29	44-82
Span Spell	73.33	7.96	53-88
Gr 2	73.32	7.77	54-88
Gr 3	73.43	9.71	53-84
Eng Oral	447.7	15.5	394-467
Gr 2	446.3	16.0	394-465
Gr 3	456.0	9.3	444-467
Eng Reading	440.3	17.2	400-473
Gr 2	438.6	17.4	400-473
Gr 3	450.0	13.0	436-469
Span Oral	475.1	9.4	450-491
Gr 2	473.7	9.5	394-465
Gr 3	482.9	3.4	479-488
Span Reading	474.3	13.7	449-502
Gr 2	474.0	13.6	449-501
Gr 3	475.7	15.1	454-502

[a]n for all subjects = 47 for Eng Spell2 and 48 for all other variables.

n = 41 at Grade 2 and 7 at Grade 3 (Eng Spell2 at Grade 3 = 6).

TABLE V

COMPARATIVE MEAN SCORES IN READING AND ORAL LANGUAGE

	Norming Studies			Present Study	
	Grades			Grades	
Tests	Kdg	First	Third	Second	Third
English Oral	455.4	469.1	489.4	446.3	456.0
English Reading	396.2	430.4	487.1	438.6	450.0
Spanish Oral	460.9	472.8	490.1	473.7	482.9
Spanish Reading	---	447.7	489.9	474.0	475.7

These comparisons support characterizing the subjects of this study as follows:

- their level of oral English proficiency was well below that of English-speaking second and third graders;
- they did possess some ability to read in English, although not at the level of ability of English-speakers in the same grades;
- these subjects are "literate" in Spanish (in relation to their grade levels), have at least as much ability to read in Spanish as they have in English, and have sufficient reading ability in Spanish to expect that this skill could impact upon their learning to read and spell in English.

Thus, these subjects seemed to possess the levels of knowledge one might expect from students in the primary grades of a TBE program in the United States. They could read in Spanish well enough so that their teachers could use grade-level Spanish texts should they choose to do so; they were well behind their grade-level monolingual English speaking peers in oral English

proficiency; yet, they did have more ability to read in English than would be typical of students growing up in an exclusively monolingual Spanish-speaking environment.

Developmental Spelling Tests scores can sometimes be more readily interpreted when they are expressed as overall spelling stage ratings. Morris and Perney (1984) reasoned that to categorize a DST score as representing a particular overall stage rating a minimum of two-thirds of the child's spelling should reflect that particular conceptual level. The lower boundary, then, for any stage rating can be expressed by a simple formula: $nx - n/3$, where n = the number of items on the DST and x = the value of a particular stage score. The average DST scores in Table IV, then, reflect that the subjects were quite proficient at spelling in Spanish; their overall Transitional Stage rating indicates that their spellings very frequently accounted for all of the sounds in the tested words while omitting sounds of any words was rather infrequent, and many words were spelled correctly. Their level of English spelling proficiency at the beginning of the study was quite another matter, however. Their average score of 36 converts to a stage rating of Semiphonetic 2 and indicates that they consistently represented consonant boundaries but fell short of rendering complete phonetic maps of these words with regularity. Understandably, their use of orthographic, or visual, features of words in English spelling was quite rare.

It might seem inconsistent that the children were able to account for all the sounds in a word in Spanish while being unable to do likewise in English. However, this has two possible explanations. The students might have accounted for all of the sounds in the English words but did so by using Spanish letter-sound correspondences. Also, because the English words are

less likely to be within the children's meaning vocabularies, their auditory images of the words might not be so clearly established.

Over the twenty weeks of the study the children improved significantly in their English spelling from their pre-test mean of 36.25 to their post-test mean of 54.04 $t = 14.16$, $p < .01$, one-tailed. This improvement can also be shown more readily when presented as stage ratings. Table VI shows the number of students at each spelling stage at both test administrations of the English

TABLE VI

MOVEMENT ACROSS ENGLISH SPELLING STAGES

Pre-test Stages	Post-test Stages				
	Semi 1	Semi 2	Phonetic	Trans	Correct
Semiphonetic1	3	9	1		
Semiphonetic2		4	18	6	1
Phonetic			1	2	1
Transitional				1	

DST and reveals rapid and unidirectional movement across the stages. Twenty-nine subjects (62%) advanced one stage, and another nine subjects (19%) advanced two or more stages. These data clearly show that the subjects experienced growth in their ability to spell in English.

B. Relationships among reading, spelling, and oral language

It was to be expected that reading, spelling, and oral language proficiency measures would be highly related. This is confirmed in Table VII which reports the intercorrelations among the scores of all of the tests given.

TABLE VII

INTERCORRELATIONS AMONG ALL VARIABLES

Variables	Spanish Reading	English Oral	English Reading	Spanish Spell	English Spell1	English Spell2
Span Oral	.18	.18	.13	.26	.13	.22
Span Rdg	---	-.01	.61	.77	.56	.58
Eng. Oral		---	.53	.04	.36	.47
Eng Rdg			---	.59	.80	.82
Span Spell				---	.53	.60
Eng. Spell1					---	.82

When $r \geq .36$, $p < .01$.

n = 47 for all correlations with English Spelling2.

n = 48 for all other pairs of variables.

Three particular patterns can be seen from these data. The first is the relatively low, although positive, correlations between Spanish Oral and the other measures. This pattern can probably be attributed to the examiner's lack of fluency in the test language. Care was taken by using a test with a completely scripted format, the examiner received training from the fluent bilingual teachers, and students' responses were audiotaped and confirmed by

the bilingual teachers. Nevertheless, these steps might have been insufficient to realize valid test results. The same pattern of low intercorrelations did not occur with the Spanish Reading subtest. The Reading subtest, however, merely requires that students read silently and respond with a one-word answer; whereas, the Oral Language subtest requires the examiner to pronounce test words to the subject and to occasionally ask a probing question.

A second pattern in these data is that there is a substantial relationship within skills across languages (e.g. Spelling in Spanish and English, or Reading in Spanish and English). These correlations range from .53 to .61. This pattern is certainly consistent with the view that literacy skill is transferable across languages.

The third pattern that emerges from these data is that the greatest correlations are those between the reading measures and the DSTs within languages. These ranges from .77 to .82 and replicate patterns that have been demonstrated in previous studies with English DSTs and reading measures by Ferroli and Shanahan (1987) and Morris and Perney (1984) among others. These also confirm the predictive validity of the Spanish DST as reported by Ferroli and Krajenta (in press).

The results reported to this point provide a description of the abilities of the subjects, document that considerable improvement in their ability to spell in English had occurred, confirm the interrelatedness of literacy skills within and across languages, and underscore the validity of the DSTs. The analysis of the results now turns to answering directly the first research question by attempting to explain the relationship among the

various literacy and language skills and to identify which abilities seemed to contribute to the growth in English spelling ability.

C. Predictors of English reading and spelling acquisition

A very practical question that arises in programs that use a native literacy approach is "When the student ready to begin English reading and spelling instruction?" This is a difficult and multi-faceted issue--one that has been called "the greyest area in bilingual education" (Pena & Verner, 1980, p. 430). In a TBE program that uses a native literacy approach while simultaneously maintaining an early-exit objective children begin the transition to English reading quite early. The students in this program received formal reading and spelling instruction in Spanish through first- and, for some, second-grade. They also received instruction in oral English skills. As the time to begin reading instruction in English approaches, the teachers wonder: "It is more important (toward initial success in English reading) to be proficient in oral English, or is it more beneficial to be highly literate in the native language?"

A backward stepwise multiple regression was conducted in which the English Reading pre-test score was the dependent variable and the English Oral, Spanish Reading, and Spanish Oral pre-test scores served as independent variables. The Spanish Oral score did not account for a significant portion of the variance and was dropped from the equation. The remaining two variables accounted for 66 percent of the variance in the English Reading score $F(2,45) = 43.73$, $p < .01$, whereas the English Oral by itself only accounted for 27 percent of the variance in the English Reading scores. Thus, using both Oral English and L1 reading ability more than doubles one's ability to explain English Reading ability.

Beyond trying to determine what knowledge helps students get started in learning to read in English, it is also important to try to identify what abilities students possess that allow them to profit from literacy instruction in English. A forward stepwise multiple regression was conducted in which the English DST post-test score was the dependent variable. The first independent variable entered into the equation was the English DST pre-test score. Having controlled for the influence of the pre-test score the remaining variance can be interpreted as the change, or improvement, in English spelling ability that occurred during the study. As shown in Table VIII the students' ability to spell in Spanish and their oral English ability separately accounted for significant and approximately equal proportions of the remaining variance. It seems, then, that as these students reason out the spellings of English words they draw simultaneously upon their spelling knowledge from Spanish and upon their knowledge of oral English. Taken together, these multivariate analyses indicate that the subjects' abilities in native language reading and spelling were at least as important as their proficiency in oral English when it came

TABLE VIII

MULTIPLE REGRESSION ANALYSIS FOR ENGLISH SPELLING POST-TEST

Independent Variables	F	R^2	R^2 change	Simple r
English Spelling Pre-test	93.87	.68	.68	.82
Spanish Spelling	55.66	.72	.04	.60
English Oral	46.57	.76	.04	.47

* $p < .01$ for all R^2.

to determining their readiness to begin to learn to read in English and when it came to predicting how much the students might profit from one semester of English spelling instruction.

D. The weekly samples and the transitional-developmental hypothesis

Answering the remaining research questions required determining how the subjects spelled each phoneme in the weekly samples. To accomplish this phonemes were isolated within words and across weeks. For example, /m/ occurred in the words comb, mitten, marches, measure, messes, and game in weeks 2, 2, 6, 7, 10, and 11 respectively. For each occurrence, the various spellings produced were tallied and then summed. Table IX shows the percent of correct spellings rendered for each phoneme and the one or two most frequent substitutions. They are ranked according to frequency of correct

spellings in order to show which sounds were readily transferred from Spanish to English and which spellings were problematic for these subjects.

TABLE IX

PERCENT OF CORRECT SPELLINGS AND COMMON SUBSTITUTIONS

Spelling Feature =	Percent Correct	Common Substitutions	Note
L initial=	100		
M initial=	99		
S as /z/ =	98		final phoneme
F initial=	98		
T initial=	96		
R initial=	95		
N initial=	95	M = 3	
N final =	94		
S as /s/ =	94		final phoneme
P medial =	94		
B initial=	88	V = 2	
		D = 6	
M final =	87		
P initial=	87		
S blends =	86	vowel + S = 7	initial
D initial=	85		
G as /g/ =	84		
P final =	83	T = 4	
X =	81	C, K, or Q with S = 9	
W initial=	76	G = 10	
H =	74	J = 11	
		G = 10	
F final =	70	V = 12	
C as /k/ =	67	K = 12	
		Q = 14	
K final =	63		
L final =	61	O = 20	
D final =	60	omit = 6	
DR /ǰr/ =	57	TR = 13	
Y initial=	51	LL = 12	
K initial=	51	C = 30	
		Q = 17	
J initial=	49	Y = 15	
		G = 12	
V initial=	44	B = 38	
C as /s/ =	30	S = 70	
QU initial	29	C = 37	
B medial =	28	omit = 50	preceding es or ed
Z =	24	S = 68	
V medial =	24	omit = 24	
		B =13	
		F = 29	
V final =	13	F = 71	final phoneme

TABLE IX

PERCENT OF CORRECT SPELLING AND COMMON SUBSTITUTIONS

Spelling Feature	Percent Correct	Common Substitutions	Note
CONSONANT DIGRAPHS			
CH	49	SH = 19 H = 8	
SH	44	CH = 32 H = 15	
TH as /ð/	42	D = 42	
TH as /θ/	22	D = 22 F = 9 T = 20	Use of T occurred only in initial position.
S as /ž/	2	CH = 36 SH = 34 H = 12 J = 7	
SHORT VOWELS			
A	77		
E	72	A = 15	
I	66	E = 16	
O	57	A = 29	
U	39	A = 30 O = 22	
R - INFLUENCED VOWELS			
OR	72	O = 9	
AR	70	OR = 8 A = 8	
IR	24	OR = 22 ER = 17	
UR	23	OR = 20 ER = 9 R = 9	

TABLE IX

PERCENT OF CORRECT SPELLING AND COMMON SUBSTITUTIONS

Spelling Feature	Percent Correct	Common Substitutions	Note
MARKED LONG VOWELS			
A =	45	E = 19 (unmarked) marked but incorrect = 18 A = 14 (unmarked)	
O =	35	O = 37 (unmarked)	
E =	25	I = 32 (unmarked) E = 21 (unmarked)	(EE or EA)
I =	22	AI = 17 A = 11 (unmarked) I - 11 (unmarked)	
U =	9	U = 46 (unmarked) two vowels = 10	(UE in true)
MORPHEMES			
S as /z/ =	74	omit = 9	inflected or plural
S as /s/ =	71	omit = 9	
ES as /z/ =	50	omit = 9 S = 13 IS = 7	
-ed as /əd/=	32	ET = 15 omit = 13	
-ed as /d/ =	10	D = 51 omit = 16	
-ed as /t/ =	4	T = 8 T =52 omit = 22	

The individual spellings produced by five selected subjects were followed as an exploratory approach in order to determine if certain types of errors were associated with subjects of different ability levels. These subjects were selected by first developing a simple scattergram which used the English spelling pre-test scores along one axis and the Spanish spelling pre-test scores along the other. The median scores of each variable were used to divide the subjects into four quadrants representing high and low scores in English and Spanish spelling. From each quadrant the most representative subject was selected by identifying the datapoint that was midway between the median lines yet furthest away from the intersection of them. Thus, four subjects were chosen to represent the High-English/High-Spanish, High-English/Low-Spanish, High-Spanish/Low-English, and Low-Spanish/Low-English spellers. A fifth subject whose scores in both Spanish spelling and English spelling fell exactly at the intersection of the median lines was also identified. That subject's score represented Mid-English/Mid-Spanish spelling ability. As the frequency of each spelling was tallied, the spellings produced by these five subjects suggested relationships between errors and abilities. Two examples of this analysis are presented in Table X.

Subsequent analyses examined the misspellings in relation to the subjects' pre-test scores on the English and Spanish DST's in order to discover if Spanish spelling knowledge was contributing to or interfering with learning to spell in English. The transitional-developmental hypothesis was tested by determining if certain misspellings were associated with high or low amounts of overall spelling ability in Spanish and in English. Three patterns were identified in these analyses and will serve as the organizational framework for the remaining results.

TABLE X

SPELLINGS PRODUCED BY REPRESENTATIVE STUDENTS

	/ǰ/ as in jaw					/əd/ as in pointed					
	Weeks					Weeks					
Spellers	2	6	8	15	19	3	5	11	14	17	20
HiSpan/HiEng	Y	J	J	Y	J	YD	ED	ED	ED	ED	ED
HiSpan/LoEng	Y	Y	J	Y	Y	--	EN	IME	--	ET	ES
MidSpan/MidEng	J	J	J	SH	J	ANE	E	ID	AS	IDE	ITE
LoSpan/HiEng	J	J	J	J	J	IT	ED	ED	ET	ED	ED
LoSpan/LoEng	H	J	H	SH	SH	ES	ES	ET	E	EN	ET

1. Spanish spelling knowledge did not interfere with learning English letter-sound associations

There were many misspellings that reflected the influence of Spanish orthography. If those misspellings were produced by children whose scores were high in Spanish spelling one might infer interference. However, this was not the case. In fact, these misspellings were produced by children who were lacking in English spelling knowledge.

One example is found in the case of y in the initial position in the words yard, years, and yell. It was spelled correctly 51 percent of the time. The most frequently used misspelling was a Spanish-like LL. The spellings of this sound in the word yard (Week 11) were more closely examined as more LL spellings and fewer Y spellings occurred with this word. The mean spelling scores of students who used Y were compared to those of students who used LL. There was no difference in Spanish spelling (DST pre-test) as the Y spellers had a mean of 75.3 and the LL spellers had a mean of 73.4, $t = 0.59$, $p = .59$. There was a difference, however, in the students' English spelling abilities as the Y user had a mean score of 44.4 and the LL users had a mean of 32.9, $t = 2.38$, $p < .05$. Thus, the Spanish-like spelling of LL for /j/ was not associated with a high degree of Spanish spelling knowledge but seems to have resulted from not possessing the needed English spelling knowledge.

A second example was found in the spellings produced for /h/. It was spelled correctly with H 74 percent of the time. The most frequently used misspellings were G and J--both letters could account for /h/ in Spanish. The spellings of this sound in the word hurt (Week 4) were selected for examination as this was the occasion on which there were the greatest number of G and J spellings and the fewest correct spellings. There was no difference in Spanish spelling as the H spellers had a mean of 74.9 and the G and J spellers had a mean of 74.2, $t = 0.31$, $p = .76$. As with the previous example, there was a difference in the students' English spelling abilities as the H users had a mean score of 40.9 and the G and J users had a mean of 33.0, $t = 2.22$, $p < .05$. Again, the Spanish-like spellings were not associated with high Spanish spelling scores. Rather, Spanish-like spellings appear when English spelling knowledge is lacking.

A final example involves the spelling of /θ/, or unvoiced th, which was spelled correctly 22 percent of the time. Frequent misspellings were D (22 percent) and F (9 percent). Students used T 20 percent of the time, but these occurred only when /θ/ was in the initial position. Using D for /ð/ was viewed as an accurate Spanish-like spelling. Students who used F for /θ/ were viewed as less accurate but English-like spellers. To explain the spelling of D as Spanish-like and F as English-like requires examining some articulatory features:

/θ/ is an unvoiced aveolar fricative;

/f/ is an unvoiced labial fricative (differs in place of articulation);

/ð/ is a voiced aveolar fricative (differs in voicedness).

Voicedness is not relevant in Spanish. Thus, while /θ/ does not exist in Spanish its voiced equivalent, /ð/, does, and it is spelled with d. Thus, the student who uses D for /θ/ ignores voicedness (Spanish-like) and is very sensitive to place of articulation (one aveolar fricative for another). The student who uses F for /θ/ attends to voicedness (English-like) but is less sensitive to place of articulation as a labial fricative is used instead of an aveolar fricative.

This analyses raises a fundamental question: if the goal is proficient English spelling, is it better to spell very well but in a Spanish-like way, or is it better to spell only moderately well but in an English-like way? Scores of the D and F spellers in week seven were compared as this was the occasion on which there were several and nearly equal numbers of D and F spellings (10 and 9, respectively). The phonetically accurate but Spanish-like D spellers had a mean English spelling pre-test score of 39.1 while the less accurate but English-like spellers had a mean of 30.9. While the

difference was non-significant, $t = 1.92$, $p = .07$, the magnitude of the difference among a small sample suggests that it remains plausible that the student who spells English words in a Spanish-like way and does it very well is nearer to being correct than is the student who spells English words in an English-like way but does so only moderately well.

These three examples indicate that when faced with an English spelling task the children drew upon their English spelling knowledge base. If and when they were lacking in English they used Spanish--their other available knowledge base, and the more developed it was the better it served them. It is difficult, then, to argue that Spanish spelling knowledge negatively transfers or interferes in any way with learning to spell in English. Instead Spanish-like spellings of English words should be interpreted as systematic and generally successful problem-solving.

2. A conceptual understanding of how spelling works positively transfers across languages.

Spelling by letter names is one of the first strategies that monolingual English speakers employ (e.g. empty = MT). During first- and second-grades children abandon this strategy in favor of more informed strategies based on letter-sounds and on patterns of letters. In the examples that follow the children who employed a letter-name strategy were found to be of below average ability in both Spanish and English spelling. That is, children who progressed beyond a letter-name strategy in Spanish transferred that conceptual understanding of spelling to English.

The first example occurred as students attempted to represent the sound /ǰ/--a sound that does not occur in Spanish. Students correctly used J 49 percent of the time. The most frequent misspelling used Y. It is argued that

use of Y represents a letter-sound rather than a letter-name strategy. Simply stated, the name of the letter y whether named in Spanish or in English does not include /ǰ/ nor anything close to /ǰ/. It seems likely that Y is chosen on a letter-sound basis because in Spanish it can represent a sound similar to /ǰ/ as in yo in some dialects. In contract to the letter-sound choice of Y, it is argued that spelling /ǰ/ by using H is a letter-name strategy. The common English sound for h is /h/ and in Spanish h is silent. However, in both languages the letter-name includes /č/, an unvoiced aveolar fricative while /ǰ/ is a voiced aveolar fricative. Although H was used to spell /ǰ/ only six percent of the time it provided a useful comparison as it must be a letter-name spelling whether it was being named in Spanish or English while Y must be a letter-sound strategy.

The comparison was made from week two where the word jaw elicited six H spellings and six Y spellings. In spite of the rather small number, the Y-spellers were superior to the H-spellers on the Spanish DST pre-test, $t = 2.48$, $p < .05$. The difference on the English DST with this small sample was not significant, $t = 2.11$, $p = .06$, although the mean English DST pre-test score of the Y-spellers far surpassed that of the H-spellers (43.3 versus 24.7). It seems that if the children knew better than to spell by letter-names in Spanish, they knew better than to do so in English.

A second illustration also showed that spelling by sounds in Spanish is nearer to correctness than spelling by names in English. In the attempts at words that began with dr which, when pronounced, is /ǰr/, correct spellings were produced 57 percent of the time across weeks 2 (dropped), 8 (draw), and 18 (dropped). The most frequent misspelling was TR which occurred in 13 percent of the cases. TR, pronounced /čr/, is an unvoiced aveolar affricate

and differs from dr (/ǰr/), a voiced aveolar affricate, only in voicedness. Due to the irrelevance of voicedness in Spanish, TR can be interpreted as the Spanish-like phonetic equivalent of dr. By contrast, spelling dr with G or J is viewed as an English-like spelling. In English these may be letter-name or letter-sound renderings, but, in Spanish, neither the names nor the sounds would yield /ǰ/. Therefore, while some G and J users might have been using a letter-name strategy and some using a letter-sound strategy, all were using an English spelling strategy. The question, again, is which strategy (Spanish letter-sound or English letter-name or sound) is closer to correct?

To answer this question each spelling that used G or J or TR was tracked across subsequent spellings in order to determine which of these spellings, if any, immediately preceded correct spelling. There were nine occurrences of using G or J for dr. The next time a dr word was presented these students spelled with J or G four times, TR twice, DR twice, and one other. Overall, there was little movement toward correctness.

TR was used 24 times. On the next dr word one of the TR-users spelled with G, four repeated TR, 15 correctly used DR following their use of TR, and there were four others. A sign test was used to determine if there was progressive movement toward correctness for those students who used TR. Later spellings of J or G were assigned a minus; repeating TR or using some other spelling was assigned zero and indicated no change; and a later spelling of DR was assigned a plus. The sign test confirmed that there was progressive movement from a TR spelling to a correct spelling at the next opportunity, $z = 2.46$, $p < .01$. Again the evidence indicates that a student who uses a Spanish phonetic (letter-sound) strategy is closer to being correct than a student who uses a letter-name strategy in English.

The final example of the positive transfer of a conceptual understanding of spelling presents less than compelling evidence, but it is offered because it begins to point out a hierarchy of transitional-developmental error types. The exemplar is /ž/ as in measure, treasure, and pleasure--a phoneme that does not exist in Spanish. It has the lowest number of correct spellings of any feature in the study--three times, or two percent. The four most frequent misspellings, in order were: CH, SH, H and J. Computing the average English and Spanish DST scores of students who produced these misspellings for the word pleasure in week 19 revealed the data in Table XI.

The small numbers of subjects and fairly small differences between mean scores meant that there were no significant differences among any of the groups, yet the rank order of the DST mean scores for the groups of misspellings is the same in both languages, and it suggests a hierarch of misspellings that is logically appealing and entirely compatible with the linguistic articulatory framework that has been used in interpreting results in almost all previous research on developmental spelling. The misspelling of /ž/ are explained in terms of place of articulation and in terms of voicedness as follows:

J = same place of articulation and voiced--strategy is letter-sound;

SH = same place of articulation but voiceless--strategy is letter-sound;

CH = near in place of articulation and voiceless--strategy is letter sound;

H = strategy is letter-name.

TABLE XI

MEAN DST SCORES FOR FOUR TYPES OF ERRORS ON /ž/ IN PLEASURE

		Spelling Pre-tests	
Spellers	n	Eng	Span
J Users	4	39.0	75.0
SH Users	12	36.3	74.3
CH Users	15	35.9	73.7
H Users	5	31.6	67.4

This suggests at least a hypothetical sequence of transitional spelling stages that describes the strategies.

Strategy 1 = letter-name strategy.

Strategy 2 = letter-sound strategy based on nearness in place of articulation.

Strategy 3 = letter-sound strategy with correctness in place of articulation but insensitive to voicedness.

Strategy 4 = correct place of articulation and sensitive to voicedness.

The importance of the above hypothesized sequence of transitional spelling stages and strategies is twofold. First, it adds voicedness as a dimension in explaining the misspellings, or invented spellings, of students such as these. Secondly, because a learner can move from strategy 1 to strategy 2 and from strategy 2 to strategy 3 while still spelling in Spanish,

it implies that, for students in transition, spelling well in Spanish just might serve them better than spelling only moderately well in English.

These three analyses lead to the conclusion that children do not regress in their understanding of spelling when they begin to spell in a second language. Quite the opposite seems to be the case. Whatever conceptual understanding they had of the spelling system in their native language seems to be applied in the new language.

3. There was a general insensitivity to spelling past-tense markers

Monolingual English children tend to spell past tenses, plurals, and inflected endings phonetically at first. However, early on they learn to spell plurals with S and each past tense with -ED in spite of how they sound. The Spanish-literate children in this study did not show that tendency.

As reported in Table IX, the children showed a very low percent of correctly spelled past tense markers. When the -ed sounded /d/ or /t/ the children spelled it phonetically more than half of the time; further, omitting the marker altogether occurred more frequently than correct spellings. There were probably two forces at work on these spellings. The first is that these words end with consonant sounds. If the -ed marker is added to a base word that ends in a consonant then these words, in effect, end with two consonant sounds (grabbed, hoped)--a condition which is not found in Spanish. It is understandable that the Spanish literate children would have initial difficulty in representing these sounds. Yet, is this difficulty persistent? Or do the children become more sensitive to consonant sounds at the ends of words?

The spellings of -ed as /t/ were grouped as omissions, phonetic spellings (include D or T), or other. A clear pattern emerged across the six

sample words in which this feature was included (weeks 2, 6, 9, 12, 15, and 18); as time went on, there was a steady decrease in the number of omissions which was coupled with a steady increase in the number of phonetic spellings, $\chi^2 = 19.41$, $dr = 10$, $p < .05$. Thus, although the past tense marker might have been problematic because it represents a final consonant sound, the children were fairly rapidly coming to terms with accounting for final consonants.

A second explanation for the children's low percentage of correctly spelled past tense markers is that speculated upon by Temple (1978). That is, although the children had reached fairly high degrees of spelling proficiency in Spanish, the equivalent past tense markers in Spanish are phonetically regular. Thus, to be good spellers required phonetic sophistication, it did not require that the children become sensitive to spelling in patterns based on morphemes.

The previous section concluded that children's conceptual understanding of spelling transfers across languages. The pattern of misspellings for past tense markers offers negative transfer evidence of this same point. That is, when one approaches spelling in a second alphabetic language, there are, of course, differences in letter-sound correspondences, and these are resolved as one learns the appropriate correspondences in the second language. Of far greater importance is the conclusion that in approaching spelling in a second alphabetic language one attempts to transfer one's conceptual understanding of spelling. Thus, if a child discovers the alphabetic principle, she or he will bring that discovery to bear on the second language. If a child discovers that words are spelled not by letter-names but by letter-sounds, that discovery, too, will be applied to the second language. And if a child discovers that one way of accounting for all sounds is by representing what

one hears (spelling by ear) that is the approach the learner will take to spelling in the second language.

These findings lead to a revision of the transitional-developmental hypothesis. The hypothesis now states: When a child who is literate in one language attempts to learn literacy in a second language a) phonological understandings of L1 will be applied to L2 only in the absence (not in interference) of L2 phonological knowledge, and phonological understandings will be acquired fairly rapidly, and b) conceptual understandings of how L1 literacy works will be systematically and persistently applied or misapplied to the second language.

V. DISCUSSION

Teachers in an early-exit TBE program wrestle with the question of when to de-emphasize native language literacy instruction in favor of getting about the business of English reading instruction "because time is running out." Such well-intentioned reasoning is unsupported by the data presented in this investigation. The results indicate that for the purpose of learning literacy in English the child is gaining at least as much from L1 literacy instruction as she or he is gaining from oral English instruction.

In determining a student's readiness to profit from English reading instruction one should assign at least as much weight to a child's proficiency in native language literacy as to the child's oral skill in English. Utilizing a measure of native language reading skill when making placement or grouping decisions can more than double one's ability to predict subsequent English reading performance beyond what can be predicted when only oral English proficiency is taken into account.

At the same time, the issues don't quite reduce simply to the relative benefits of L1 instruction versus L2 instruction. The findings of this study suggest that there is yet a third avenue for curriculum--that which might be taught in the native language that is particularly useful for subsequent transfer to English. The revised transitional-developmental hypothesis states that a learner's conceptual understanding of how literacy works is consistently applied to the second language. For teachers of students in transition, this has implications for teaching spelling in Spanish, teaching reading in English, and for teaching spelling in English.

A. Spanish spelling instruction

It would seem very much in order that native language spelling programs for the Spanish-English transitional learners heavily emphasize those aspects of Spanish spelling that can be presented as patterns or morphemes or any learnings that require more than spelling by ear. Such a curriculum might include patterns such as: hard and soft c in comparison to use of s and qu, using g to account for /g/ and /h/, and the use of gu versus gü.

Spelling lessons might also emphasize present participles (-ando, -iendo) and past tense endings (-ado, -ido). Although such special attention is unnecessary in learning to spell Spanish for its own sake, in teaching Spanish spelling for its subsequent facilitative effects on learning English spelling attention to these and other morphemes has appeal.

Finally, additional attention might be paid to b and v words and to s and z words in Spanish. There are no particular rules for determining when to use either letter of these pairs and for that very reason it could be fruitful instruction that informs learners: "Spelling is not to be approached by a simple reliance on the sounds of words. One must spell by eye as well as by ear." Thus, an English-like conceptualization of spelling can be nurtured in Spanish.

A Spanish spelling program such as this might be implemented when students reach what Ferroli and Krajenta (in press) identified as the transitional spelling stage. At this stage spellers have moved beyond a letter-name approach and to a letter-sound approach. Also at this stage they are quite sophisticated in their segmentation and representation of phonemes so that they could profit from native language spelling instruction that draws

attention to letter patterns, to morphemes, and to the need for a visual strategy in spelling.

B. Reading instruction

That a learner's conceptual understanding of how literacy works is systematically and persistently applied to L2 has importance for reading instruction. The fact that children bring their native language literacy to bear in L2 says that, in very simple terms, whatever is to be learned about reading that works the same way in both languages is probably more easily learned in the native language.

This would include such fundamental understandings as how prior knowledge aids in comprehending text. Cultural differences can certainly contribute to what knowledge one does or does not acquire. Yet, facility in actively constructing meaning by interrelating information in the text with information already stored in memory is probably more easily developed in one's native language and transferrable.

It would include understanding that one uses context clues in word identification and in learning new word meanings. Syntactic differences between English and Spanish are considerable. Nevertheless, the fundamental conceptual understanding that arises from reading in a language that one speaks fluently is that one's knowledge of grammatical constraints is useful in word identification and for reasoning out the meaning of a word when it is encountered in context.

Another understanding about reading that is probably more easily figured out in the native language is that in reading one uses both graphophonic information and contextual information and that neither cuing system is as productive as both used together. On the other hand, it seems possible that a

learner attempting to acquire reading with an inadequate oral language base might be hindered from developing efficient use of multiple cuing systems by needing to rely on one cuing system almost exclusively.

Something else included in the list of understandings about reading that might be better developed in the native language is that there are many functions and personal uses of reading and writing. The list of transferable understandings could go on much longer. Certainly it would include almost anything one could think of in the way of a study or comprehension skill or strategy. The list could even include typographic signals. Although these differ across the two languages, their importance and some of their functions are the same.

As others have said before, one probably learns to read only once. The evidence presented in this study indicates that how one conceptualizes literacy is what transfers, and the list of what one needs to unlearn is quite short. If reading is like spelling in that what one understands about the process itself is what transfers, then the trick is to become as good a reader as you can in the native language so that learning the surface features (orthography) of the second language is the only unique reading task.

C. English spelling instruction

The final piece of the curricular picture to serve students such as those described in this study is concerned with the nature and content of the English spelling curriculum once the children have made the transition and English spelling is being emphasized. A sequence of four spelling stages used by these students was hypothesized previously. It was suggested that students can progress through one, two, and three while learning to spell in Spanish. The most sophisticated strategy involves learners' being sensitive to the

importance of voicedness in discriminating between pairs of phonemes. A scope and sequence for learning English spelling would begin with those items identified as the easiest ones in Table IX. At some later point generous attention should be paid to studying how to spell sounds that are alike in terms of place of articulation and different only in voicedness. Thus, /b/ versus /v/ is not the important contrast; rather /b/ versus /p/ and /v/ versus /f/ are sounds that differ in voicedness. In like fashion, /s/ versus /z/, /č/ versus /ǰ/, /k/ versus /g/, and /š/ versus /ž/ also differ in voicedness. Such a spelling curriculum is less concerned with Spanish-like spellings that might leak into English and more concerned with one of the fundamental ways that words are distinguished in English and for which a Spanish speaking youngster might be underprepared.

Developmental research implies that patterns of behavior should be consistent across various settings. Nevertheless, subsequent research might determine is similar results would be found among other learners in transition. Students considerably older than those in this study who emigrated later in life or students in a late-exit TBE model are faced with the task of learning English literacy while armed with much greater degrees of L1 literacy skill and might exhibit somewhat different behaviors.

Spelling was the main area of concern in this study. Generalizations were made about how the results relate to both word recognition and comprehension. Future research might include a closer examination of the influence of vocabulary. Although knowledge of word meaning was incorporated into the oral language tests used in this study, additional research that uses improved measures of word meaning might lead to a better understanding of the

relationship between literacy and oral language in attempting to provide a more complete explanation of the transfer of literacy skill.

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APPENDICES

Appendix A

SCORING SYSTEM FOR THE ENGLISH DEVELOPMENTAL SPELLING TEST

Correct spellings are assigned five points. Misspellings are scored as follows.

Zero points

A random string of letters is produced (MAU for lake) or a spelling in which the beginning letter is unrelated to the initial phoneme (PCT for tack) or no response.

One point

Only the beginning consonant sound is represented acceptably (MOTM or M for mail; C for skin).

Acceptable substitutions. An acceptable consonant is one that is linked in some logical way to the phoneme to be represented. This might be one that is sometimes used to represent the sound (C to begin skin or stick) or on the basis of letter-name similarity (Y for w) or place or manner of articulation (G, or J to begin dress or dragon). Reversals are accepted as correct at the beginning stages (up to three points); thus, DNO for bleed receives one point as the initial D is interpreted as a common reversal of b.

Two Points

A) Acceptable beginning and ending consonants are used and vowels are omitted or incorrect. Dress may be spelled GS, JC, or DRS for two points.
B) Acceptable beginning consonants plus correct or acceptable vowel substitutions are used. For long vowels, the acceptable letter-name substitution is a single letter spelling of the correct long vowel sound (BE for bleed = two points). For short vowels, the acceptable letter-name substitutions are a for /e/ and e for /I/ (DA for dress = two points).

Three points

The child renders a complete phonetic map of the word. The beginning and ending consonants are accounted for and long vowels are spelled by letter-name (MAL for mail; BED for bleed) or short vowels use the allowable substitutions (SEK for stick; GAS for dress). A score of three is assigned even though the second letter of an initial consonant blend is omitted (SEN for skin, PAS for press, SEK for stick).

Extra letters. Spelling which represent all the sounds in a word but have extra letters (TABK for tack) can be difficult to score. Extra consonants (except nasals, m and n) should be viewed as breaking up the phonetic map of the word that is required for a score of three. The extra B in TABK breaks up the phonetic map and is given a score of two even though three sounds are correctly represented.

The scorer may be more tolerant of extra vowels than of extra consonants. A general guide is that for three points one extra vowel letter may be disregarded if it is adjacent to a vowel that is an acceptable one. Thus, SEIN for skin and PEES for press receive three points each. Extra single vowels (except for a final e) are not accepted as they add a syllable. Thus, SEKEIN for skin is assigned two points for representing the consonant boundaries but not three points as the extra syllable breaks up the phonetic map.

Four Points

Transitional stage spelling reflects a knowledge of English spelling patterns as children learn that spelling is not just the simple matching of letters to sounds. Spellings receive four points when all consonant sounds are represented conventionally. Dress, for example, now must be spelled with

DR. Stick must begin with ST, not CT, but side may be spelled CIDE for four points as conventional English spelling does allow words to begin with ci. Both letters of a consonant blend must be included (STIK = four but SIK = three). Short vowels must be spelled correctly (DRES for dress), and long vowels must be marked by a subsequent vowel (LITE for light).

Two-syllable words. For two-syllable words an acceptable vowel spelling is required in the stressed syllable for three points, and there must be a consonant to indicate recognition of the second syllable. Thus, score two points for dragon as JRAN (missing the boundary of the accented syllable) and three points for GAGN. To merit four points two-syllable words must include correct short vowels or marked long vowels in the stressed syllable, and a vowel letter must be used in the unstressed syllable (DRAGN = three but DRAGIN = four).

Problematic scorings. When considering difficult to score items, the scorer should think in terms of taking credit away. JRAGIN seems to merit four points as the short vowel is correct and a vowel letter appears in the unstressed syllable. However, the initial spelling of JR rather than DR shows a phonetic orientation to the word. Therefore, the conservative score of three is assigned as a point is taken away.

At the same time, the scorer should always prefer an understanding of developmental spelling to an overly-rigid adherence to the scoring criteria. Thus, LIGT for light, according to the rules, might seem like a two-point rendering as the long vowel is not marked and the G breaks up the phonetic map. A better interpretation is that the G results from a visual strategy--knowing what the word looks like. This goes beyond a simple phonetic strategy. Thus, in LIGT, the vowel is marked, the G is not an extra

consonant, and the score is four. For another example, LITES for light might, by the rules, be scored two as, technically, the final consonant boundary is incorrect. However, this student is clearly using a long vowel marking strategy and inadvertently wrote a plural. Score four.

The influence of Spanish spelling knowledge. There are many misspellings produced by Spanish-literate children which are probably influenced by their knowledge of Spanish letter-sound relationships. For example, it is common for these children to produce spellings for stick and skin which begin with vowels as Spanish has no initial s-blend. The English DST, however, is interpreted as a measure of how English-like the spellings are. Thus, ESKEN or ASTEC receive zero points as the first letter written does not acceptably represent the initial sound in the word. This procedure underestimates the children's phonemic segmentation ability, but it accounts for their knowledge of how English is spelled.

This same reasoning results in a set of consonant substitutions which are not acceptable. B may be substituted for v on the Spanish DST, but it is not an acceptable substitution on the English DST. J is not an acceptable substitute for h. W may be spelled with Y but not with C, Q, H, or G. The Spanish literate child is likely to spell p with B as the difference between /p/ and /b/ is one of voicedness, and voicedness is not phonemically relevant in Spanish. Also, p is sometimes spelled with V which is similar to b in Spanish, or with D which might be a reversal of B. In any case, voicedness is phonemically relevant in English, so there are no acceptable substitutions for p.

Appendix B

SCORING SYSTEM FOR THE SPANISH DEVELOPMENTAL SPELLING TEST

Correct spellings are assigned five points. Omitting tildes or accent marks are not considered errors. Misspellings are scored as follows.

Zero Points

A spelling is produced for which there is not relationship between the first letter written and either the first consonant or the vowel of the first syllable.

One Point

The first letter written represents either the first consonant or the vowel of the first syllable (B or I for brincando; E or S for estrella).

Acceptable substitutions. Ambiguous consonants, while incorrect, are accepted as representing the target sound. B and V may be interchanged as may: J and G; C, S, and Z; C, K, and Q; LL and Y; N and Ñ; and RR and R.

Two Points

A spelling is produced in which any of the following are represented: a) the initial consonant and another consonant in the target word (BCN for brincando), or b) the initial consonant and the correct first vowel (SUE for sueño), or c) the initial vowel and one consonant (ESAH for estrella).

Three Points

At the phonetic stage of development spellings come quite close to completely mapping the sounds of the target word. In English consonants are more salient than vowels. In Spanish, however, the reverse is true. Spanish has more consistency among vowel sounds, less vowel reduction than English, and more ambiguity among consonants. Further, Spanish words are comprised of more but shorter syllables than are English words. Thus, for the Spanish DST,

a complete phonetic map and a three point score, are determined by correctly representing the vowel element in each syllable. Consonants may be omitted, but no vowel substitutions are accepted. In single vowel cases, the vowels must be spelled correctly (BINADO for brincando or VEAO for verano). In the cases of diphthongized vowels or vowel pairs, either of the two vowels must be spelled correctly (BILE for baile or SUNO for sueño).

Four Points

In transitional stage spellings every sound must be accounted for (JENTE for gente, BRINKANDO for brincando). One deviation from correct spelling is permitted so long as no sound is omitted (JENTE for gente = four points but GETE or JETE = three points). Diphthongized vowels must be marked by using two consecutive vowels or one vowel followed by Y, LL, or ~. The spelling of saquen maintains the /k/ sound with a K or Q between the vowels (SAKEN or SAQEN = four points but SACEN = three).

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ABSTRACT

THE TRANSFER OF SPELLING SKILL AMONG PRIMARY GRADE BILINGUALS: A TRANSITIONAL-DEVELOPMENTAL HYPOTHESIS

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How children's knowledge of a phonetically regular spelling system (Spanish) interacts with learning the multi-dimensional nature of English spelling was investigated. Forty-eight second- and third-grade students in a Transitional Bilingual Education program were administered pre-tests in English and Spanish of oral language, reading, and developmental spelling. Five-word English spelling samples which incorporated features likely to be problematic were collected for 20 weeks. The English Developmental Spelling Test (DST) was administered as a post-test. Results confirmed the predictive validity of the English and Spanish Developmental Spelling Tests and showed that native language (L1) literacy proficiency predicts both the ability to read in English (L2) and subsequent growth in English spelling as well as or better than does oral English proficiency. That the two variables, taken together, doubled the ability to predict English reading and spelling achievement suggests that L1 literacy and L2 oral explain separate portions of the variance of L2 literacy. Other analyses determined that the Spanish literate children showed a great number of correct English spellings, and they seemed to produce Spanish-like spellings of English words only when they did not process the necessary English phonological knowledge. Thus, their

knowledge of Spanish letter-sound correspondences supported rather than interfered with their English spelling. Within letter-sound correspondences, voiced and unvoiced phoneme pairs were the most frequently confused. It is argued that this is due to the fact that voicedness is not phonemically relevant in Spanish. Thus, one contribution of this study to the research on developmental spelling is the identification of voicedness as an important feature in explaining the English misspellings of Spanish literate children. Beyond letter-sound correspondences the children's conceptual understanding of how spelling works was found to transfer in ways that had both positive and negative effects on their learning to spell in English. A transitional-developmental hypothesis is offered which endorses emphasizing morphology in L1 spelling instruction, continuation of native language reading and spelling instruction even in an early-exit TBE program, and an emphasis on phonemic spellings that differ in the dimension of voicedness once English literacy instruction is begun.